CLAIMS

1. A method of reducing a fluctuation in a cut-off voltage of a cathode for an electron tube in which a metal layer (9) for protrusively deforming a cathode substrate (7) when heated is formed on a surface (7a) of said cathode substrate (7), and an electron emissive material layer (11) is formed on a front face (7a) of said cathode substrate (7) directly or through said metal layer (9) and heating means (5) for heating said electron emissive material layer (11) to emit a thermion from a front face (11a) of said electron emissive material layer (11) is provided,

wherein when said front face (11a) of said electron emissive material layer (11) is consumed and retreats, said protrusive deformation of said cathode substrate (7) by said metal layer (9) is induced by a heating operation of said heating means (5) so that said front face (11a) of said electron emissive material layer (11) is correspondingly deformed protrusively.

2. The method of reducing a fluctuation in a cut-off voltage according to claim 1, wherein said metal layer (9) is formed on said front face (7a) of said cathode substrate (7) and is alloyed with a metal contained in said cathode substrate (7) by a heating operation of said heating means (5) and is thus expanded, thereby protrusively deforming said front face (7a) of said cathode substrate (7).

3. The method of reducing a fluctuation in a cut-off voltage according to claim 1, wherein said metal layer (9) is formed on concavo-convex portions provided on said surface (7a) of said cathode substrate (7).

4. The method of reducing a fluctuation in a cut-off voltage according to claim 2, wherein said metal layer (9) is formed on concavo-convex portions provided on said surface (7a) of said cathode substrate (7).

5. The method of reducing a fluctuation in a cut-off voltage according to claim 1,

wherein said metal layer (9) is divided into a plurality of parts which are dispersively formed on said surface (7a) of said cathode substrate (7).

6. The method of reducing a fluctuation in a cut-off voltage according to claim 2, wherein said metal layer (9) is divided into a plurality of parts which are dispersively formed on said surface (7a) of said cathode substrate (7).

7. The method of reducing a fluctuation in a cut-off voltage according to claim 3, wherein said metal layer (9) is divided into a plurality of parts which are dispersively formed on said surface (7a) of said cathode substrate (7).

8. The method of reducing a fluctuation in a cut-off voltage according to claim 4, wherein said metal layer (9) is divided into a plurality of parts which are dispersively formed on said surface (7a) of said cathode substrate (7).

9. A cathode for an electron tube comprising a cathode substrate (7), a metal layer (9) formed on a surface (7a) of said cathode substrate (7) and heated to protrusively deform said cathode substrate (7), an electron emissive material layer (11) formed on a front face (7a) of said cathode substrate (7) directly or through said metal layer (9), and heating means (5) for heating said electron emissive material layer (11) to emit a thermion from a front face (11a) of said electron emissive material layer (11),

wherein when said front face (11a) of said electron emissive material layer (11) is consumed and retreats, said protrusive deformation of said cathode substrate (7) by said metal layer (9) is induced by a heating operation of said heating means (5) so that said front face (11a) of said electron emissive material layer (11) is correspondingly deformed protrusively.

10. The cathode for an electron tube according to claim 9, wherein said metal layer (9) is formed on said front face (7a) of said cathode substrate (7) and is alloyed with a metal contained in said cathode substrate (7) by a heating operation of said heating means

(5) and is thus expanded, thereby protrusively deforming said front face (7a) of said cathode substrate (7).

11. The cathode for an electron tube according to claim 9, wherein said metal layer (9) is formed on concavo-convex portions provided on said surface (7a) of said cathode substrate (7).

12. The cathode for an electron tube according to claim 10, wherein said metal layer (9) is formed on concavo-convex portions provided on said front face (7a) of said cathode substrate (7).

13. The cathode for an electron tube according to claim 9, wherein said metal layer (9) is divided into a plurality of parts which are dispersively formed on said surface (7a) of said cathode substrate (7).

14. The cathode for an electron tube according to claim 10, wherein said metal layer (9) is divided into a plurality of parts which are dispersively formed on said surface (7a) of said cathode substrate (7).

15. The cathode for an electron tube according to claim 11, wherein said metal layer (9) is divided into a plurality of parts which are dispersively formed on said surface (7a) of said cathode substrate (7).

16. The cathode for an electron tube according to claim 12, wherein said metal layer (9) is divided into a plurality of parts which are dispersively formed on said surface (7a) of said cathode substrate (7.

17. A method of manufacturing a cathode for an electron tube, comprising the steps of:

(a) forming, on a surface (7a) of a cathode substrate (7), a metal layer (9) for protrusively deforming said cathode substrate (7) when heated;

(b) forming an electron emissive material layer (11) on a front face (7a) of

said cathode substrate (7) directly or through said metal layer (9); and

(c) providing heating means (5) for heating said electron emissive material layer (11) to emit a thermion from a front face (11a) of said electron emissive material layer (11),

wherein at said step (a), said metal layer (9) is formed in such a manner that when said front face (11a) of said electron emissive material layer (11) is consumed and retreats, said protrusive deformation of said cathode substrate (7) through said metal layer (9) is induced by a heating operation of said heating means (5) and said front face (11a) of said electron emissive material layer (11) is correspondingly deformed protrusively.

18. The method of manufacturing a cathode for an electron tube according to claim 17, wherein at said step (a), said metal layer (9) is formed on said front face (7a) of said cathode substrate (7) by a metal which is alloyed with a metal contained in said cathode substrate (7) by a heating operation of said heating means (5) and is thus expanded, thereby protrusively deforming said front face (7a) of said cathode substrate (7).

19. The method of manufacturing a cathode for an electron tube according to claim 17, wherein at said step (a), concavo-convex portions are formed on said surface (7a) of said cathode substrate (7) and said metal layer (9) is formed on said concavo-convex portions.

20. The method of manufacturing a cathode for an electron tube according to claim 18, wherein at said step (a), concavo-convex portions are formed on said surface (7a) of said cathode substrate (7) and said metal layer (9) is formed on said concavo-convex portions.

21. The method of manufacturing a cathode for an electron tube according to claim 17, wherein at said step (a), said metal layer (9) is divided into a plurality of parts which are dispersively formed on said surface (7a) of said cathode substrate (7).

22. The method of manufacturing a cathode for an electron tube according to claim 18, wherein at said step (a), said metal layer (9) is divided into a plurality of parts which are dispersively formed on said surface (7a) of said cathode substrate (7).

23. The method of manufacturing a cathode for an electron tube according to claim 19, wherein at said step (a), said metal layer (9) is divided into a plurality of parts which are dispersively formed on said surface (7a) of said cathode substrate (7).

24. The method of manufacturing a cathode for an electron tube according to claim 20, wherein at said step (a), said metal layer (9) is divided into a plurality of parts which are dispersively formed on said surface (7a) of said cathode substrate (7).